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10/812,101	03/30/2004	Teruyoshi Takeuchi	0819.0004C	2733

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EDELL, SHAPIRO & FINNAN, LLC
1901 RESEARCH BLVD.
SUITE 400
ROCKVILLE, MD 20850-3164

EXAMINER	
THOMAS, JAISON P	

ART UNIT	PAPER NUMBER
1751	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/812,101	TAKEUCHI ET AL.	
	Examiner	Art Unit	
	Jaison P. Thomas	1751	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 March 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) *10* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9 and 11-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-22 are pending. Claim 10 is withdrawn. Claim 20 is amended.

2. The rejections of Claims 1,3,5,9,11,15,19 and 22 under 35 USC 102(b) as being anticipated by Minamisawa et al. (US Patent 4500660) are withdrawn in view of applicant's arguments.

3. The rejections of Claims 2,4,6-8,12-14,16-18 and 21 under 35 USC 103(a) as being unpatentable over Minamisawa et al. (US Patent 4500660) are withdrawn in view of applicant's arguments.

4. The rejection of Claim 20 under 35 USC 112, second paragraph as being indefinite is withdrawn in view of applicant's amendments.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-9 and 11-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ochi et al. (US Patent 5334661) in view of Adedeji et al. (US Patent 6815491).

"The present invention relates to an epoxy resin modified material obtained by reacting an epoxy resin and a phenolic hydroxyl-containing aramid/polybutadiene-acrylonitrile block copolymer represented by formula (I)." (Column 1, lines 56-60). Epoxy resins that can be used include "bisphenol A types, bisphenol F types" and

"Novolak type epoxy resins" (Column 2, line 45 and Column 2, line 50). "The above-mentioned polybutadiene-acrylonitrile copolymer having a carboxyl group at both terminals thereof is commercially available, for example, under a trade name "Hycar CTBN" sold by BF Goodrich Co., and such a commercially available product may be utilized in the present invention." (Column 4, lines 67-68 thru Column 5, lines 1-2). "Specific but non-limiting examples of the hardeners which can be used in the present invention include ... tertiary amines, e.g., amineimide; imidazole salts..." (Column 5, lines 28-59). "In the fiber-reinforced composite materials using the epoxy resin composition of the invention, the reinforcing fibers include inorganic fibers, e.g., carbon (graphite) fiber... Carbon fiber may be PAN-based carbon fiber or pitch-based carbon fiber." (Column 7, lines 7-16). "The resin composition may be impregnated into uniaxially arrayed fibers or woven fabric. The fiber-reinforced composite material has a fiber content usually of from 10 to 90% by weight, and preferably from 20 to 80% by weight." (Column 7, lines 20-23). Reference example 1 shows the invented composition being used to form a coating 8 to 10 micrometers thick. (Column 15, line 45). Example 18 shows a sample of the epoxy resin composition having a thickness 0.7 mm. (Column 14, line 56).

Ochi is relied upon as disclosed above. However, Ochi does not teach vapor growth carbon fibers or that these carbon fibers should be compounded in a polar organic solvent as required by Claim 1 or the volume resistivity as required by Claim 19.

Adedeji teaches a reinforced thermoplastic composition containing a variety of reinforcing fillers. The fillers include "Reinforcing fillers may include ... carbon fibers,

including poly (acrylonitrile) (PAN) fibers, vapor-grown carbon fibers, and especially graphitic vapor-grown carbon fibers having an average diameter of about 3 to about 500 nanometers.." (Column 9, lines 19-25).

With respect to the vapor grown carbon fibers, it would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the vapor-grown carbon fibers of Adedji with the carbon fibers of Ochi since substitution of art-recognized equivalents is within the level of ordinary skill in the art.

With respect to the compounding step, the examiner notes MPEP 2113 which states, "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). "The Patent Office bears a lesser burden of proof in making out a case of *prima facie* obviousness for product-by-process claims because of their peculiar nature" than when a product is claimed in the conventional fashion. *In re Fessmann,* 489 F.2d 742, 744, 180 USPQ 324, 326 (CCPA 1974). Once the examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. *In re Marosi,* 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983)."

With respect the volume resistivity limitation of Claim 19, the examiner respectfully submits that one of ordinary skill in the prior art would reasonably expect the prior art to exhibit the claimed limitation. Specifically, the reference teaches identical components and is produced in the same/similar manner and thus could be reasonably expected to possess the volume resistivity as claimed.

7. Claims 1,3,5,9,11,13,15,17, 19, 20 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over in view of Adedeji et al. (US Patent 6815491).

Minamisawa et al. teaches an epoxy resin composition having excellent adhesive strength wherein the composition comprises a bisphenol A type epoxy resin, a novolak type epoxy resin, a glycidyl amine type epoxy resin, a reaction product between a acrylonitrile-butadiene copolymer and a glycidyl amine type epoxy, a nitrile rubber, curing agent and accelerator and a reinforcing fiber (Abstract). The nitrile rubber is defined as a copolymer of butadiene and acrylonitrile where in the rubber can have alpha or beta unsaturated carboxylic acids as a comonomers (which examiner construes as inherently creating a carboxyl-terminated acrylonitrile butadiene rubber) (Column 4, lines 56-60). The bisphenol A resin is a condensation product of bisphenol and epichlorohydrin (Column 2, lines 11-12). Reinforcing fibers that can be used include carbon fibers with sizes ranging from 1 to 100 mm (Column 6, lines 51-57). The composition is prepared by dissolving the epoxy resin composition discussed above in organic polar solvents such as acetone or cellosolve and then impregnating the fibers with the solution (Column 6, lines 61-67) and sheet-like prepreg materials can be

formed from this resulting material (Column 6, line 68). One curing accelerator disclosed includes the formula of structure (V) and includes a tertiary amine when Z is substituted with -CH2CH2CN (Column 5, lines 12-24).

Minamisawa is relied upon as disclosed above. However, Minamisawa does not suggest the use of vapor grown carbon fibers or the compounding step of Claim 1, or volume resistivity of Claim 19 or an electroconductive sheet with a thickness of 1 mm or less as required by Claim 21.

Adedeji teaches a reinforced thermoplastic composition containing a variety of reinforcing fillers. The fillers include "Reinforcing fillers may include ... carbon fibers, including poly (acrylonitrile) (PAN) fibers, vapor-grown carbon fibers, and especially graphitic vapor-grown carbon fibers having an average diameter of about 3 to about 500 nanometers.." (Column 9, lines 19-25).

With respect to the vapor grown carbon fibers, it would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the vapor-grown carbon fibers of Adedji with the carbon fibers of Minamisawa since substitution of art-recognized equivalents is within the level of ordinary skill in the art.

With respect to the compounding step, the examiner notes MPEP 2113 which states, "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re*

Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). "The Patent Office bears a lesser burden of proof in making out a case of *prima facie* obviousness for product-by-process claims because of their peculiar nature" than when a product is claimed in the conventional fashion. *In re Fessmann,* 489 F.2d 742, 744, 180 USPQ 324, 326 (CCPA 1974). Once the examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. *In re Marosi,* 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983)."

With respect the volume resistivity limitation of Claim 19, the examiner respectfully submits that one of ordinary skill in the prior art would reasonably expect the prior art to exhibit the claimed limitation. Specifically, the reference teaches identical components and is produced in the same/similar manner and thus could be reasonably expected to possess the volume resistivity as claimed.

With respect to the electroconductive sheet thickness it would have been obvious to one of ordinary skill in the art at the time the invention was made to choose a sheet thickness 1 mm or less as an obvious design choice and said thickness would not render the claimed sheet patentably distinct over the teachings of the prior art.

8. Claims 1,3,5,11,13,15,17,19 and 22 rejected under 35 U.S.C. 103(a) as being unpatentable over Inaike et al. (US Patent 4749748) in view of Adedeji et al. (US Patent 6815491

"An epoxy resin adhesive composition comprising (A) an epoxy compound having at least two epoxy groups on the average in the molecule and (B) a reaction product obtained by reacting an aliphatic polyamine compound represented by the general formula H.sub.2 N(CH.sub.2 CH.sub.2 NH).sub.n H, in which n is 2 to 5, with a diene type liquid rubber having a terminal carboxyl group and a molecular weight of 1,000 to 7,000 so that the molar ratio of the aliphatic polyamine compound to the diene type liquid rubber is in the range of from 5 to 100." (Abstract). " In the present invention, as the epoxy compound (A), there are preferably used a bisphenol A type epoxy resin, a bisphenol F type epoxy resin, a novolak-epoxy resin formed by reaction of a novolak resin with an epihalohydrin, a polyfunctional phenol type epoxy resin, a glycidylamine type polyfunctional epoxy resin, halogenation products thereof and mixtures of two or more of them. Furthermore, there may be used a diglycidyl ether compound obtained by reaction of resorcinol with an epihalohydrin, a glycidyl ester type epoxy resin, a polyglycol type epoxy resin, a cyclic aliphatic epoxy resin and a hydantoin type epoxy resin." (Column 1, lines 65-68 thru Column 2, lines 1-8). "As the diene type liquid rubber having a terminal carboxyl group, there may be used liquid rubbers having a molecular weight of about 1,000 to about 7,000, such as carboxyl-terminated acrylonitrile-butadiene rubber, polybutadiene rubber, polyisoprene rubber and polychloroprene rubber. Acrylonitrile-butadiene rubber and polybutadiene rubber are especially preferred. As typical commercial products, there can be mentioned Hycar CTBN 1300X8, Hycar CTBN 1300X13 and Hycar CTB 2000X162 (each being supplied by B. F. Goodrich Co.), NISSO PB C-1000 and NISSO PB C-2000 (each being supplied

by Nippon Soda Co.), and Poly BD R-45MA (supplied by Idemitsu Petrochemical Co.)." (Column 2, lines 18-27). " A filler or reinforcer, for example, ... a carbon fiber ..." (Column 2, line 65). Examples show an adhesive layer formed from the invented composition having a thickness of 0.15 mm (Column 3, line 36).

Inaike is relied upon as disclosed above. However, Inaike does not suggest the use of vapor grown carbon fibers or the compounding step of Claim 1, or volume resistivity of Claim 19.

With respect to the vapor grown carbon fibers, it would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the vapor-grown carbon fibers of Adedji with the carbon fibers of Inaike since substitution of art-recognized equivalents is within the level of ordinary skill in the art.

With respect to the compounding step, the examiner notes MPEP 2113 which states, "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). "The Patent Office bears a lesser burden of proof in making out a case of *prima facie* obviousness for product-by-process claims because of their peculiar nature" than when a product is claimed in the conventional fashion. *In re Fessmann,* 489 F.2d 742, 744, 180 USPQ 324, 326 (CCPA 1974). Once the examiner provides a rationale tending to show that

the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. *In re Marosi,* 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983)."

With respect the volume resistivity limitation of Claim 19, the examiner respectfully submits that one of ordinary skill in the prior art would reasonably expect the prior art to exhibit the claimed limitation. Specifically, the reference teaches identical components and is produced in the same/similar manner and thus could be reasonably expected to possess the volume resistivity as claimed.

Allowable Subject Matter

9. Claim 22 rewritten with the limitations of Claims 1 and 2 would be allowable over the prior art of record if the species directed to "liquid acrylonitrile-butadiene rubber having both end-groups substituted by carboxyl groups" of Claim 22 is deleted. The prior art does not teach, suggest or motivate a composition which utilizes the remaining Markush groups of rubber materials and epoxies of Claim 22 and vapor grown carbon fibers at the percentages specified by Claim 2.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jaison P. Thomas whose telephone number is (571) 272-8917. The examiner can normally be reached on Mon-Fri 8:30 am to 5:00 pm.

11. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Douglas McGinty can be reached on (571) 272-1029. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jaison Thomas
Examiner
5/1/2007

JT

DOUGLAS MCGINTY
SUPERVISORY PATENT EXAMINER
1751